TABLE 2. Total yield (7 harvests) of eight slicing cucumber cultivars grown on polyethylene mulch in fall, 1988 at Live Oak, FL.

| Cultivar | Seed[y] source | Yield by U.S. grade category (by/acre) Fancy[x] | No. 1 | No. 1 Large | No. 1 Small | No. 2 | Cull | Total |
|---|---|---|---|---|---|---|---|---|
| *Centurion* | NK | 261 ab | 164 ab | 47 bc | 78 c | 137 a | 50 ab | 687 ab |
| Comet A II | AS | 184 bc | 154 ab | 73 bc | 120 abc | 120 ab | 58 a | 651 b |
| Dasher II | PE | 285 a | 179 a | 35 c | 126 ab | 120 ab | 57 ab | 745 a |
| General Lee | FM | 197 bc | 151 ab | 44 bc | 138 a | 110 ab | 36 b | 641 b |
| Monarch | AS | 176 c | 152 ab | 151 a | 87 bc | 132 a | 60 a | 699 ab |
| Revenue | FM | 252 abc | 129 b | 80 b | 108 abc | 109 ab | 48 ab | 678 ab |
| Striker | AS | 252 abc | 156 ab | 39 c | 106 abc | 92 b | 47 ab | 610 b |
| Supersett | PE | 239 abc | 153 ab | 50 bc | 116 abc | 126 a | 56 ab | 684 ab |

[y]Seed sources were Northrup King (NK), Asgrow (AS), Peto Seed (PS), and Ferry-Morse (FM).
[x]Means in the column with the same letter are not significantly different by Duncan's multiple range test (p = .05).

and very frequent harvest to prevent the fruits from sizing excessively.

Overall, 'Dasher II', 'Supersett', and 'Revenue' were the best performers in this trial. They were in the highest yielding group for early and total marketable yields. In addition, these 3 cultivars produced higher yields of U. S. Fancy and U. S. No. 1 grade fruit, the highest value grades. "Comet A II' performed in the intermediate class for earliness but ranked low for total yields. This cultivar is evidently early, but does not produce high yields over an extended harvesting season. 'Monarch' was intermediate to good in performance for both early and total yield, but had poor quality as evidenced by low U. S. Fancy and U. S. No. 1 grades.

The poorest performing cultivars in this test were Striker and General Lee. Both had low early yields and low total seasonal yields.

All 8 of the cultivars in this trial were also evaluated in a larger trial conducted at Bradenton in the fall of 1988 (Bradenton GCREC Research Report BRA 1989-5). Very similar results were obtained for most of the cultivars. 'Revenue', 'Supersett', and 'Dasher II were among the top performers in both trials. All other cultivars in both trials performed in a very similar manner relative to each other.

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*Proc. Fla. State Hort. Soc.* 102:324-326. 1989.

# PRUNING METHOD EFFECTS ON YIELD, FRUIT SIZE, AND PERCENTAGE OF MARKETABLE FRUIT OF 'SUNNY' AND 'SOLAR SET' TOMATOES

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*Additional index words. Lycopersicon esculentum*, suckering.

*Abstract.* **Tomato (*Lycopersicon esculentum* Mill.) pruning studies were conducted in 1983, 1984, 1988 and 1989. Treatments included no pruning, removal of 50% of the suckers to the first fork (light) and removal of all axillary shoots (suckers) to the first fork (heavy). Heavy pruning of 'Sunny' reduced yields over no pruning or light pruning. Fruit size increased as the degree of pruning increased in 2 of 3 years (excluded in 1989). Pruning method did not affect percentage of marketable fruit. Total yields of 'Solar Set' (planted 1988 and 1989) were reduced by heavy pruning but largest fruit size occurred with heavy pruning. Heavy pruning also produced the lowest percentage of marketable fruit. Heavy pruning of 'Solar Set' removed too much foliage and allowed top fruit to be sunburned while heavy pruning of 'Sunny' did not.**

Florida ranks first in fresh market tomato production in the United States. During the 1988-89 season tomatoes had a farm value in excess of $600 million on 57,600 acres (Hawkins, 1989. 1988-89 Annu. Rpt. of Florida Tomato Comm.) and they comprised about 40% of the value of vegetables produced in Florida. Production costs before harvest range from $3000 to $4000/acre depending upon the production area (Taylor and Smith. Econ. Infor. Rpt. 245). Most of these tomatoes are produced using the short-stake culture method because of increased yields and quality over ground tomatoes and determinate cultivars that self-terminate at about 3 to 4 feet. In most short-stake production systems some pruning is done. The amount of

Florida Agricultural Experiment Station Journal Series No. N-00110.

pruning varies from no suckers (axillary shoots) removed to all the suckers removed to the first fork (sucker before the first bloom cluster), with the cost of pruning ranging from $0 to $64/acre. The cost of pruning comprises a very small part of the total production cost, but this operation may have a very large effect on yield and quality. Very little information is available on how to prune determinate type cultivars or if various cultivars will react differently to pruning (2, Hochmuth, VEC Circ. 98C). Davis (1) reported that with close plant spacing (12 and 18 inches), no pruning reduced the yields of fruit over 3 inches in diameter when compared to plants pruned norally. Neither the cultivar nor the normal pruning method was described in the article.

This study was initiated to find the optimum pruning method for 'Sunny' and 'Solar Set'. 'Sunny' is the most widely grown cultivar in Florida and 'Solar Set' is a new hybrid released from the University of Florida breeding program. 'Solar Set' was released as a "hot-set" cultivar for fall production. At present there is very little cultural information on 'Solar Set'. The 2 cultivars differ in the vigor of their vine growth with 'Sunny' being the more vigorous.

## Materials and Methods

Pruning studies were conducted on an Orangeburg loamy fine sand soil at the North Florida Research and Education Center in Quincy. Production was on full bed black polyethylene mulch with drip irrigation in 1988 and 1989 and overhead irrigation in 1983 and 1984. Total fertilizer applied in 1983 and 1984 was 216-52-245 lb/acre of N-P-K. In 1988 and 1989 180-65-175 lb./acre of N-P-K were applied. Beds were fumigated with methylbromide (98:2) before polyethylene mulch application. Plants were staked and tied 4 times. Between-row spacing was 6 feet and in-row spacing was 24 inches in 1983 and 1984 and 20 inches in 1988 and 1989. Tomato transplanting dates were 23 Mar. 1983, 26 Mar. 1984, 21 Mar. 1988, and 21 Mar. 1989. Cultiars used were Sunny and Solar Set. 'Solar Set' was planted only in 1988 and 1989. 'Sunny' was not harvested in 1989 due to very poor plant stands.

Pruning treatments consisted of none, light (50% of the suckers removed from the ground to the first fork which was the sucker below the first bloom cluster), and heavy (all suckers removed from the ground to the first fork). Suckers were removed while small to prevent damage to plants.

Treatments were arranged in a randomized complete block design with 4 replications used in all years except 1983 when 3 replications were used. Plot size was 20 feet.

Plants were harvested 4 times each year except 1989 where 3 harvests were made. Data collected included total yields, average fruit weight and percentage of marketable fruit.

## Results and Discussion

With 'Sunny', heavy pruning significantly reduced total yields over that obtained with no pruning or with light pruning in all 3 years (Table 1). Highest yield in all 3 years occurred with light pruning but these yields were not significantly greater than that with no pruning. Pruning methods had no effect on mean fruit weight in 1984 but in 1983 and 1988 fruit size increased as the severity of pruning increased. Although the highest percentage of marketable fruit occurred with light pruning in all 3 years, pruning methods did not significantly affect the percentage of marketable fruit. Many growers prune 'Sunny' to the first fork and may be reducing their total yields at the expense of increasing fruit size. Even with heavy pruning there was adequate foliage to cover fruit and prevent sunburning of the fruit.

Table 1. Effect of pruning methods on total yields, fruit weight and percentage of marketable fruit of 'Sunny' tomatoes, Quincy.

| Pruning method | Season | | |
|---|---|---|---|
| | 1983 | 1984 | 1988 |
| | Total yields (boxes/A) | | |
| None | 2137 a[z] | 1.831 a | 2370 a |
| Light | 2459 a | 1915 a | 2634 a |
| Heavy | 1737 b | 1348 b | 1816 b |
| | Fruit weight (oz) | | |
| None | 6.95 c | 7.01 a | 6.78 c |
| Light | 7.63 b | 7.37 a | 7.17 b |
| Heavy | 8.49 a | 7.21 a | 8.39 a |
| | Marketable fruit (%) | | |
| None | 56.1 a | 64.4 a | 71.5 a |
| Light | 62.1 a | 67.5 a | 80.9 a |
| Heavy | 57.9 a | 64.8 a | 77.9 a |

[z]Mean separation in columns by Duncan's multiple range test, 5% level.

Total yields of 'Solar Set' were reduced by heavy pruning over light or no pruning. In both years highest yields were obtained with no pruning but only in 1988 was the difference significantly higher than with light pruning (Table 2). Largest mean fruit size occurred with heavy pruning in both years and fruit size decreased as the amount of pruning decreased. No pruning resulted in the smallest fruit but was only significantly lower than those produced with heavy pruning. The percentage of marketable fruit was lowest with heavy pruning in both years. No pruning resulted in significantly higher percentages of marketable fruit than heavy pruning in both years. In 1989 light pruning resulted in a significantly higher percentage of marketable fruit than heavy pruning but not in 1988. While heavy pruning resulted in the largest fruit weight it resulted in the lowest total yield and percentage of marketable fruit. Heavy pruning also reduced the foliage cover to the extent where many fruit were not adequately covered and sunburned fruit resulted. Additional trials are planned with 'Solar Set' to evaluate very limited pruning such as removal of ground suckers only. With no pruning, both cultivars present problems with axillary shoots that

Table 2. Effect of pruning methods on total yield, fruit weight and percentage of marketable fruit of 'Solar Set' tomatoes, Quincy.

| Pruning method | Total yield (boxes/A) | | Fruit weight (oz) | | Marketable fruit (%) | |
|---|---|---|---|---|---|---|
| | 1988 | 1989 | 1988 | 1989 | 1988 | 1989 |
| None | 2685 a[z] | 2065 a | 7.06 b | 7.41 b | 77.6 a | 62.6 a |
| Light | 2243 b | 1850 a | 7.69 ab | 8.16 ab | 73.0 ab | 61.8 a |
| Heavy | 1482 c | 1379 b | 8.32 a | 8.70 a | 64.6 b | 51.1 b |

[z]Mean separation in columns by Duncan's multiple range test, 5% level.

arise later from the base of the plant. These shoots are not *caught in the* first or second tying strings and may lay on the mulch or into the middles and present problems with disease and/or weed control operations.

New cultivars should be evaluated on a limited basis to see how they react to pruning. Without knowledge of a new cultivar's vine characteristic, pruning heavy could result in reduced yields and quality.

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*Proc. Fla. State Hort. Soc.* 102:326-328. 1989.

# DOUBLE-CROPPING CUCUMBER AND TOMATOES TO MINIMIZE THE COST OF STAKING CUCUMBER


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*Additional index words.* Double-cropping system, standard system, in-row spacing, row side.

*Abstract.* **Cucumber (*Cucumis sativus* L.) double-cropped with tomato (*Lycoperscum esculentum* Mill.) and staked with the double-cropping system needed less than half the man-hours to stake than the standard system. Tomato rods and tomato plants were not removed which could result in further cost reduction. Glyphosate [N-(phosphonomethyl) glycine] was used to kill all the vegetation at a cost of $45-$50/acre. Double-cropped cucumber produced comparable yields of high quality fruits to cucumber staked by the standard system. The standard system produced more No. 2 fruits resulting in more marketable yield. The 2 systems produced an equal percentage of culls or rots. In-row spacing of 9 or 12 inches appeared to be the best choice when cucumber was staked by the double-cropping system. The side of the row where cucumber was planted did not affect the yield significantly. However, planting cucumber on both sides gave the highest yield. It appears that there was enough residual fertilizer left over after tomatoes to produce the cucumber crop.**

The demand for staked cucumbers is growing rapidly because of the superior quality of the fruit. Increased yield and good quality fruit has been reported by several investigators (1, 2, 4). However, the expense to train the plants up, and the frequent occurrence of low market prices during some periods of the year, may discourage cucumber growers from using this system (referred to in this manuscript as the standard system). On the other hand, staking fresh market tomatoes is a popular cultural system, and in many cases, polyethylene mulch and drip irrigation are used in staked tomato production. These expensive installations are normally removed after the last harvest of tomatoes.

Planting cucumbers following tomatoes on the same rows without removing any of the mentioned installations (referred to in this manuscript as the double-cropping system), may reduce the cost of staking cucumber. Also, return per acre can be enhanced by using tomato stakes, polyethylene mulch, and drip irrigation installation to produce 2 crops instead of 1. The objectives of this study were to 1) compare the standard and double-cropping systems for man-hours needed to stake cucumber and yield, 2) investigate the influence of in-row spacing and row side on yield of cucumber staked by the double-cropping system, and 3) determine the response of staked cucumber to N-P-K when double-cropped with tomatoes.

## Materials and Methods

Three studies were conducted in the summer (July-Oct.) of 1988 and 2 in 1989. In each study, cucumber was planted on same tomato rows. Tomato plants were sprayed with glyphosate at 3 lb./acre approximately 3 weeks before planting cucumber. Plot size used in all studies was 12 x 10 feet and cucumber plants were spaced 18 inches apart except when otherwise specified. Cucumber was irrigated using polyethylene distribution lines one-half inch in diameter. They were connected to the main water line with a pressure regulator and had in-line emitters spaced 12 inches apart. Irrigations were applied as needed on Mon., Wed., and Fri. Tensiometers placed 6-12 inches deep in the plant row were used to indicate when and how much to irrigate. Readings of 25-30 centibars were used to initiate irrigation.

In the first study, 'Poinsett 76', 'Dasher II', and 'Maximore 101' cucumber were planted in 3 x 2 factorial experiment arranged in a randomized complete block design with 3 and 4 replications in 1988 and 1989, respectively. Treatments were cultivars and support (standard system vs. double-cropping system). In the standard system, tomato plants and stakes (using 6 ft x 0.5 inch reinforcing rods) were removed. Rods were then installed again every 3-4 ft to simulate staking cucumber by the standard system. Four levels of string were tied to the rods 10 to 12 inches upward. The first string was tied 10 inches above the row surface and the fourth close to the rod top. Cucumber plants were tied to the string 3 to 4 times until they reached

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